56 EFFECT OF NICOTINE ON THE ELASTINOLYTIC ACTIVITY OF HUMAN LUNG TUMOR CELLS AND HUMAN ALVEOLAR MACROPHAGES

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An experimental system was established which allows the determination of cell associated elastinolytic activity. Cells were confronted with radioactive labeled elastin in culture microvessels in medium (RPMI 1640). After 72 h at 37 ^{o}C the elastinolytic activity could be calculated from the released radioactivity. For stimulation experiments nicotine was added directly to the incubation medium.

Proteolytic enzymes are thought to play a role in tumor cell invasion (1). Therefore two human tumor cell lines were used in order to study the effect of nicotine on the elastinolytic activity. HS-24 was established from a primary squamous cell carcinoma of the lung, SB-3 from a metastasis of a primary lung adenocarcinoma into the adrenal gland (2). In the case of HS-24 nicotine showed no effect on the elastinolytic activity in a concentration of 50 ng/ml. However, 100 ng/ml and 200 ng/ml had an stimulating effect. The effect was found to be less in the case of 200 ng/ml. A stimulating effect was also found when the tumor promotor 12-O-tetradecanoylphorbol-13-acetate (PMA) was added in a concentration of 5 x 10^{-9} M. In the case of SB-3 cells nicotine had no effect on the elastinolytic activity in the range betweeen 50 and 200 ng/ml. Also no stimulating effect was found when PMA was used.

Proteolytic enzymes are also thought to play a role in the pathogenesis of emphysema (3). Because of this the elastinolytic activity of alveolar macrophages (AMs) isolated from bronchoalveolar lavage fluid (BALF) of patients with and without emphysema was investigated. The existence of an emphysema was characterized by lung function values. Our first results indicated, that AMs isolated from BALF of patients with emphysema possess an higher elastinolytic activity compared to AMs of patients without emphysema. The addition of nicotine (100 ng/ml) had an stimulating effect on AMs from patients with clinical signs of emphysema, whereas AMs of patients with nonemphysematous lung diseases were less or not stimulated.

In summary our results point to the important role of cell associated elastinolytic enzymes in tumor invasion as well as in the development of lung emphysema.

LITERATURE:

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